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CERTIFICATE

This certificate is issued in support of an application for Patent registration in a country outside New Zealand pursuant to the Patents Act 1953 and the Regulations thereunder.

I hereby certify that the annexed is a true copy of the Provisional Specification as filed on 22 May 1998 with an application for Letters Patent number 330511 made by Bowers, John Murray.

Dated 23 April 1999.

Neville Harris
Commissioner of Patents

COMMISSIONER OF PATENTS, TRADEMARKS & DESIGNS
NEW ZEALAND

330511

Patents Form No. 4

Patents Act 1953

PROVISIONAL SPECIFICATION

METHOD OF CONSTRUCTION OF AN ELEVATED ANNULAR PLATFORM

I, JOHN MURRAY BOWERS, a New Zealand citizen of Grey Street, Murchison, New Zealand, do hereby declare this invention to be described in the following statement:

TITLE: METHOD OF CONSTRUCTION OF ELEVATED ANNULAR PLATFORM

Technical Field

The present invention relates to a method of construction of an annular platform which is elevated and which can be partially constructed off site and partially constructed on site. Such platforms are ones which rotate, the main example being platforms for milking sheds. Preferably the construction is of an annular platform and is substantially of reinforced concrete.

Background

Annular, elevated platforms which rotate are known. My New Zealand Patent No. 270997 discloses a method of construction of a platform which can be carried out on site. The method disclosed allows for part or all of the platform to be formed in one pour of concrete, with a means for providing a mould in an elevated position prior to the pouring.

However it has been found that there are some disadvantages to this method. Firstly, there can be undue stress placed on the concrete on one side of the centrally located beam (underneath the platform). This can occasionally lead to stress fractures or cracking of the concrete. Also, with the manner of forming of the mould (preparatory to pouring the concrete to form the platform), nearly all of this must be done on site. Thus the equipment need for supporting the mould needs to be dismantled and transported to the next site. It is difficult to use this method of construction to prepare much of the form work off site. Whilst it can be done, the method also means that the elements prepared off site, where possible, are awkwardly shaped for shipment.

Further, the boxing, if it remains under the platform, does not form an integral part

of the platform and therefore does not add structural strength to the platform.

An object of the present invention is the provision of a method of construction of an elevated annular platform which overcomes the described difficulties, and further provides a useful alternative to the presently available methods.

For the purposes of this specification, an 'elevated annular platform' is a platform which is up to two metres off the ground. It may be supported on one side with, for example, a base or foundation underneath it. This support may be a support on the inner or outer side of the annulus, so that the outer or inner part of the platform is apparently cantilevered from the base or foundation. The platform may be supported along under the centre (that is, the centre of the annulus of the platform) in addition to the above support, or instead of the above support. It may therefore be a free-standing platform with a circular support means under the platform. Such support may or may not rotate with part or all of the means of rotation of the platform, this means being secured to and/or located under the annulus.

Also for the purposes of this specification, the term 'centre line' is used to refer to the (imaginary) circle which falls at the centre of the annulus of the platform, equidistant from the inner and outer edges of the annulus.

Disclosure of Invention

The present invention provides a method of construction of an annular platform, said platform having an inner and an outer edge and including a number of bail sections, the number being equal to the number of bails, and the dimensions of each bail section being determined from the width of the platform, the number of bails and the length of the centre line; said method including the steps of:

constructing an adequate foundation to take and support the weight of the platform and the dead and live loads to be applied thereon (when completed);

erecting a curved, flanged metal support beam which is positioned along the centre line of the intended position of the platform and elevated to the pre-determined height to ensure the required elevation of the platform. the top of said beam having an inward and an outward flange or flanged edge;

preparing the bail sections, each bail section having an inner and an outer edge, and two radial sides, each bail section including:

two side supports each side support being positioned along one radial line and secured at the midpoint to the top of the flanged support beam;

at least one panel of pre-cast material, each said panel having an inner edge of the same radius as that of the inner edge of the platform, an outer edge that is the same radius as the outer edge of the platform, and two straight sides that are the same length as the length of the side supports; each panel being positioned between the two side supports and the said support beam, and between the inner and outer edges of the platform;

locating an upright edging around each of the inner and outer edges of said platform, and securing each said edging to the ends of the side supports, thereby providing a mould into which the material of the platform can be poured;

positioning and securing within the mould the required reinforcing material;

positioning and securing within the mould the required blanks, sleeves and packing for cutouts and channels to be formed in the finished platform; and

filing the mould with filler material and allowing it to set and/or cure; wherein

said filler material and said pre-cast material bond together to form a single structural layer.

Preferably each panel is of concrete, with the side supports being of angle iron. Preferably the upright edgings are left in place to form the edge of the platform, but may be removable.

Preferably the filler material is concrete. Other appropriate materials may also be used, selected from the group consisting of: natural rubber, synthetic rubber; plastics materials; or a compound comprising a combination of these materials. One major selection criterion is that the filler material and the panel material (pre-cast material) can bond together irreversibly.

Optionally there are two panels for each bail, an inner and an outer panel. The inner panel has a inner edge of the same radius as that of the inner edge of the platform and an outer edge dimensioned to rest on the flanged top of the said support beam, and two straight sides that are half the length of the side support. The inner panel is positioned on the two side supports and the said support beam, and between the inner edge of the platform and the said support beam. The outer panel has an inner edge dimensioned to rest on the flanged top of the said support beam, an outer edge that is the same radius as the outer edge of the platform, and two straight sides that are half the length of the side support. The outer panel is secured between the two side supports and the said support beam, and is positioned between the inner edge of the platform and the said support beam.

The flanged metal support beam may be a beam on its own or it may form part

of another assembly. For example, it maybe part of an I-beam forming a top support of a means of rotating a milking platform. Such means may be of the type disclosed in New Zealand Patent No. 244688.

The present invention further provides an annular elevated platform which comprises:

an annulus of material which has an inner and an outer edge;

an adequate foundation to take and support the weight of the platform and the dead and live loads to be applied thereon (when completed);

a curved, flanged metal support beam located along the centre line of the intended position of the platform and elevated to the pre-determined height to ensure the required elevation of the platform. the top of said beam having an inward and an outward flange or flanged edge;

a plurality of bail sections, the number being equal to the number of bails, and the dimensions of each section being determined from the width of the platform, the number of bails and the length of the centre line; wherein

each bail section has an inner and an outer edge, and two radial sides, each bail section including:

at least one panel of pre-cast material, each said panel having an inner edge of the same radius as that of the inner edge of the platform, an outer edge that is the same radius as the outer edge of the platform, and two straight sides that are the same length as the length of the side supports; each panel being positioned between the two side supports and the said support beam, and between the inner and outer edges of the

platform;

an upright edging around each of the inner and outer edges of said annulus, and secured to the ends of the side supports;

material which fills the mould made by the inner and outer edgings, the side supports and the inner and outer panels; wherein said filler material and said pre-cast material bond together to form a single structure as the said annulus of material.

Optionally there are two panels for each bail, an inner and an outer panel. The inner panel has a inner edge of the same radius as that of the inner edge of the platform and an outer edge dimensioned to rest on the flanged top of the said support beam, and two straight sides that are half the length of the side support. The inner panel is positioned on the two side supports and the said support beam, and between the inner edge of the platform and the said support beam. The outer panel has an inner edge dimensioned to rest on the flanged top of the said support beam, an outer edge that is the same radius as the outer edge of the platform, and two straight sides that are half the length of the side support. The outer panel is secured between the two side supports and the said support beam, and is positioned between the inner edge of the platform and the said support beam.

The present invention further provides a kit set of parts for use in the construction of an elevated annular platform, said kit including: a plurality of the elements for a bail section, said elements including:

two side supports each side support being positioned along one radial side and secured at the midpoint to the top of the flanged support beam;

at least one panel of pre-cast material per bail, each said panel having an inner edge of the same radius as that of the inner edge of the platform, an outer edge that is the same radius as the outer edge of the platform, and two straight sides that are the same length as the length of the side supports; each panel being positioned between the two side supports and the said support beam, and between the inner and outer edges of the platform;

wherein said elements are crated or packed to maximise the use of available space in a crate or container for shipping to the site of the construction of the platform.

Brief Description of Drawings

By way of example only, preferred embodiments of the present invention is described in detail with reference to the accompanying drawings, in which:-

Fig. 1 is a partial plan view of a bail section of the platform of the present invention, without the concrete filling;

Fig. 2 is a cross-section along the line AA of Fig. 1;

Fig. 3 is the same cross-section as shown in Fig. 2 after completion of the construction of the platform;

Fig. 4 is a side elevation of the end of a the join between two bail sections of the present invention, part way through the method of construction;

Fig. 5 is the same view as in Fig. 4, at the end of the method of construction; and

Fig 6 is a cross section along the line AA from Fig. 1 showing a second preferred

embodiment of the panels of the present invention.

Best Modes for Carrying Out the Invention

Referring to the Figs. 1 to 5 of the drawings, a platform 2 is thereshown in part. The platform 2 comprises a plurality of bail sections 3. The number of bail sections 3 is the same as the number of bails of the finished platform 2. A top I-beam 4, forms part of the means of rotation 5 of the platform, is as shown in New Zealand Patent No. 244688. The bail sections 3 include a top flanged portion 6 with an upper flat surface 7. The upper flat surface 7 is supported by a base 8 of concrete or reinforced concrete, in known manner. Alternatively the base 8 may be formed of a plurality of evenly spaced apart poles or beams rigidly secured to part of the means of rotation 5. The base 8 is positioned on and secured to or on the ground or other surface 29 (for example, a concrete base).

Each bail sections 3 includes two side supports 10 which are radially positioned. Each side support 10 is secured at or about its centre to the upper flat surface 7. A curved metal upright inner edging 13 and outer edging 14 (respectively) is positioned (Figs. 2 and 3) the inner edge 11 and at the outer edge 12 (Fig. 1) . The upright edgings 13 and 14 are located along all or substantially all of the inner and outer circumferences of the platform 2. The ends of each of the edgings 13 and 14 are secured to the ends of the side support 10. The method of securement can be by any known mens, for example bolting, welding (etc).

An alternative method is as shown in Figs. 4 and 5, in which the detail of the side support 10 from adjacent sections bail sections 3 can be seen. Each side support 10 is

adjacent to, but not touching the side support 10 from the adjacent bail sections 3. If so desired, an end plate 19 can be secured to the ends of the side support 10. This ensures that securing the end plate 19 or the 20 to the respective inner and outer ends of the side support 10 is easier to accomplish.

Each bail sections 3 includes an inner and an outer panel (15 and 16, respectively). The inner panel 15 is dimensioned to fit within the area bounded by the upper flat surface 7, inner edge 11, and the side support 10 of each bail section 3. The outer panel 16 is dimensioned to fit within the area bounded by the upper flat surface 7, outer edge 12, and the side support 10 of each bail section 3.

Blanks and cutouts (9, 17, 18; Fig. 1) are positioned within each bail section 3, for removal after the pouring of the concrete 23. The spaces left can then be used, for example, to secure bail dividers and milking equipment on and to the platform 2. Sleeves (not shown) can be left in place of the blanks or the cutouts, which sleeve can remain in the concrete when poured, if so desired.

Each inner panel 15 and outer panel 16 is formed of a pre-cast material. Each inner panel 15 and outer panel 16 is of a thickness that is slight compared to the finished thickness of the platform 2. The pre-cast material is optionally concrete. However other materials may also be used. For example the material may be fibre-glass, or a rigid plastics material. One selection is that the material bonds to concrete or the filler material used for the platform 2. Alternatively, if so desired, non concrete, non-metallic materials may be used for the pre-cast elements as well as for the filler.

As shown in Figs. 4 and 5, the edges of the inner panel 15 and outer panel 16 may have partial cut outs, so that when the inner panel 15 and outer panel 16 are in

position, the underside of the inner panel 15 and outer panel 16 are flush with the underside of the adjacent side support 10. The thickness of each inner panel 15 and outer panel 16 is sufficient to support the weight of the material poured to form the platform 2. The inner panel 15 and outer panel 16 need not be sufficiently strong to support the live weight on the finished platform 2 as this is achievable by the material 23 and reinforcing (21, 22), when cured.

A metal strip 20 is rigidly secured between adjacent side supports 10, with a lower portion of the metal strip 20 between the two side support 10. The upper portion of the metal strip 20 stand s above the side supports 10. Reinforcing, for example steel reinforcing rods, (21, 22, Figs. 3 and 5) is then shaped and secured within the mould of the platform 2. Some rods 22 are laid in an approximately radial pattern, across the width of the platform 2. A plurality of rods 21 are laid around the platform 2. The underside of the rods 21 are nicked so that the rods 21 can be located on each metal strip 20 across which they are positioned.

Referring to Fig. 3, the rods 21 and 22 are thereshown, without the material 23 of the platform 2 present. If so desired, and as shown in Fig. 3, the platform 2 may slope from the inner edge 11 to the outer edge 12. The placement of the reinforcing rods 21 and 22 can be adjusted accordingly, along with the portion of the metal strip 20 standing above the two side support 10. Thus the reinforcing is centrally located in the depth of the concrete 23 of the platform 2.

The above described elements are used in the method of construction of the present invention in the following manner (using concrete as the material 23): the base 8, means of rotation 5, top I-beam 4 (from New Zealand Patent No. 244688, are positioned as desired for the appropriate radius of platform 2 and at the appropriate position for the

desired elevation of the platform 2. The side supports 10 are secured, at or about the centre, to the upper flat surface 7. If the metal strip 20 is present, a metal strip 20 is welded or otherwise secured between each set of adjacent side supports 10 from adjacent bail sections 3. The inner and outer edgings (13, 14) are bolted or otherwise secured to the inner and outer ends (respectively) of the side support 10. If the end plates 19 are used, these are secured by bolting to the side supports 10 before the edgings 13, 14 are secured to the side supports 10. The blanks and cutouts 9, 17, 18 are secured in known manner in the pre-determined positions.

These elements form a free-standing mould for the annulus of the platform 2. The reinforcing rods 21 and 22 is inserted in known fashion. The concrete 23 forming the platform 2 is poured into the mould and allowed to set and cure. The concrete 23 is poured so that the mould is filled to the top of the outer upright edging 14. A slope, as described above, may be used on the top surface of the concrete 23.

The blanks and cutouts 9, 17, 18 are later removed, leaving spaces (or the sleeves, if used) ready for installation of further equipment.

Referring to Fig. 6, a second preferred embodiment of the panels (15') of the platform 2 can also be used. This panel 15' comprises the elements of the inner and outer panels (15, 16) . Thus the panel 15' combines these two panels as one panel. The panel 15' rests across the top of the flanged portion 6 and upper flat surface 7 for each of the bail sections 3. Otherwise the panel 15' is installed as described for the first preferred embodiment.

Whilst this panel 15' is the same size (in plan) as that of the bail section 3 it will be appreciated that each panel 15' may be comprised of two or more pieces, and that the

same is also the case for each inner and outer panel (15, 16) of the first preferred embodiment of the invention.

The above described platform 2 has been described as being poured in one piece. However, it will be appreciated that only part of the annular mould need be filled with the concrete 23. Thus the annulus could be formed in two or more pieces.

Also, the above described platform 2 has been described with reference to the means of rotating the platform 2 as described in New Zealand Patent No. 244688. However, it will be appreciated that the platform 2 may be used with any other means of rotation, with appropriate adjustments to the placement of the top portion 6 of the beam. Similarly it will be appreciated that the platform 2 need not be one that is capable of rotation, and which may be supported, in whole or in part, by other additional supports around the outer portion of the annulus or the inner portion of the annulus.

As can be seen from the manner of assembly of the bail section 3, each section 3 can be separated into its component parts for transportation. All the side supports 10 can be bundled together. The inner and outer panels 15 and 16 can be stacked and the edgings 13, 14 and beam 4 shipped in parts; thus making efficient use of space in a container, truck, or other storage vessel. Also if so desired, any parts of iron or steel can be galvanised or otherwise sealed before use.

If the second preferred embodiment of the panels 15' is used, these can also be stacked as described above for the first preferred embodiment.

The manner of construction and of transportation of these parts still makes the assembly of the mould for the platform 2 quick and easy. Despite this, the level of accuracy for the component parts in the construction of the platform 2 can be maintained

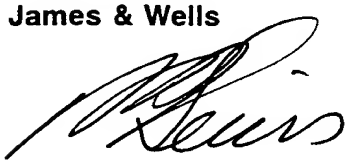
at a high level.

330511

John Murray Bowers

by his authorised agents

James & Wells



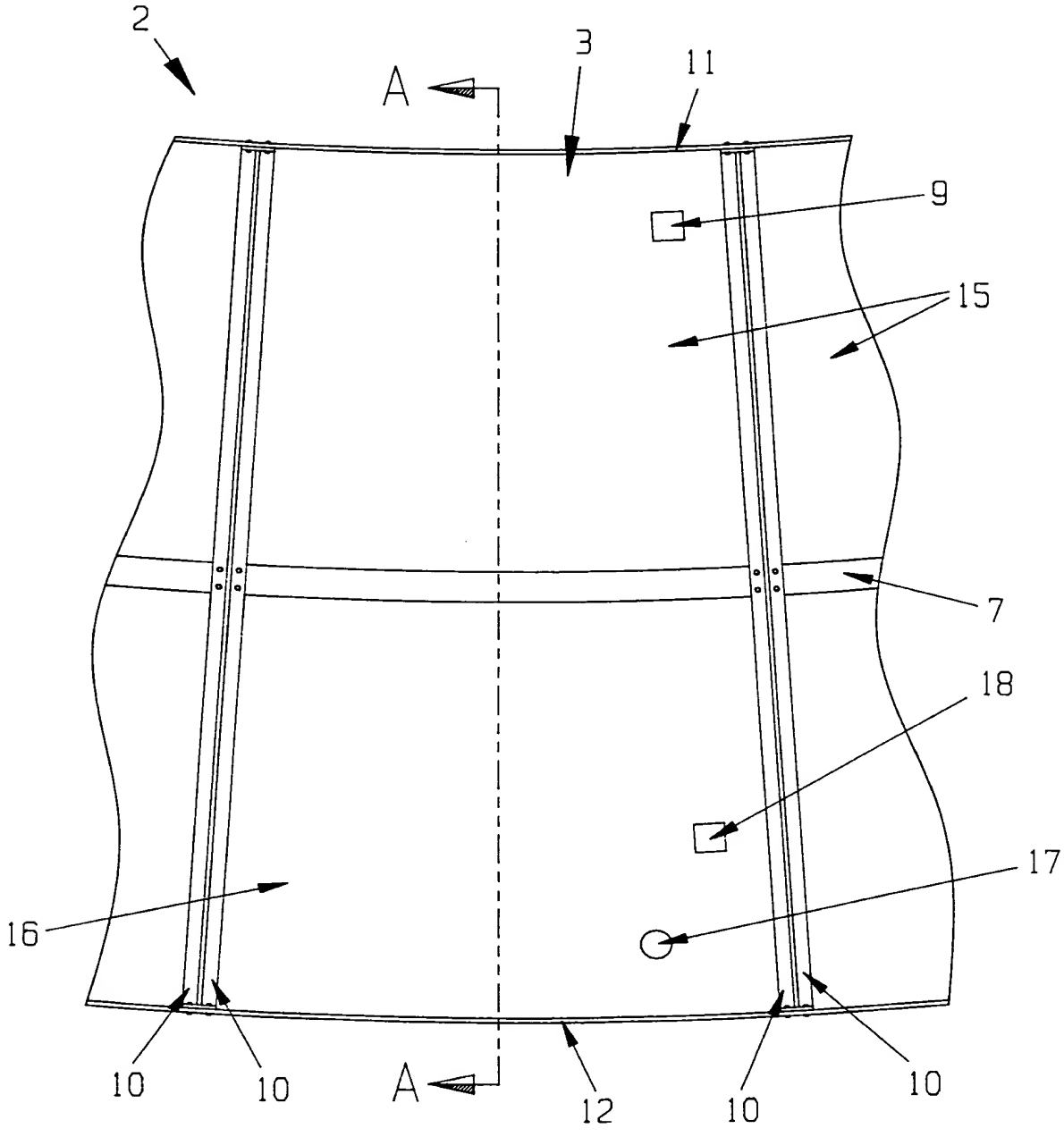


Fig. 1

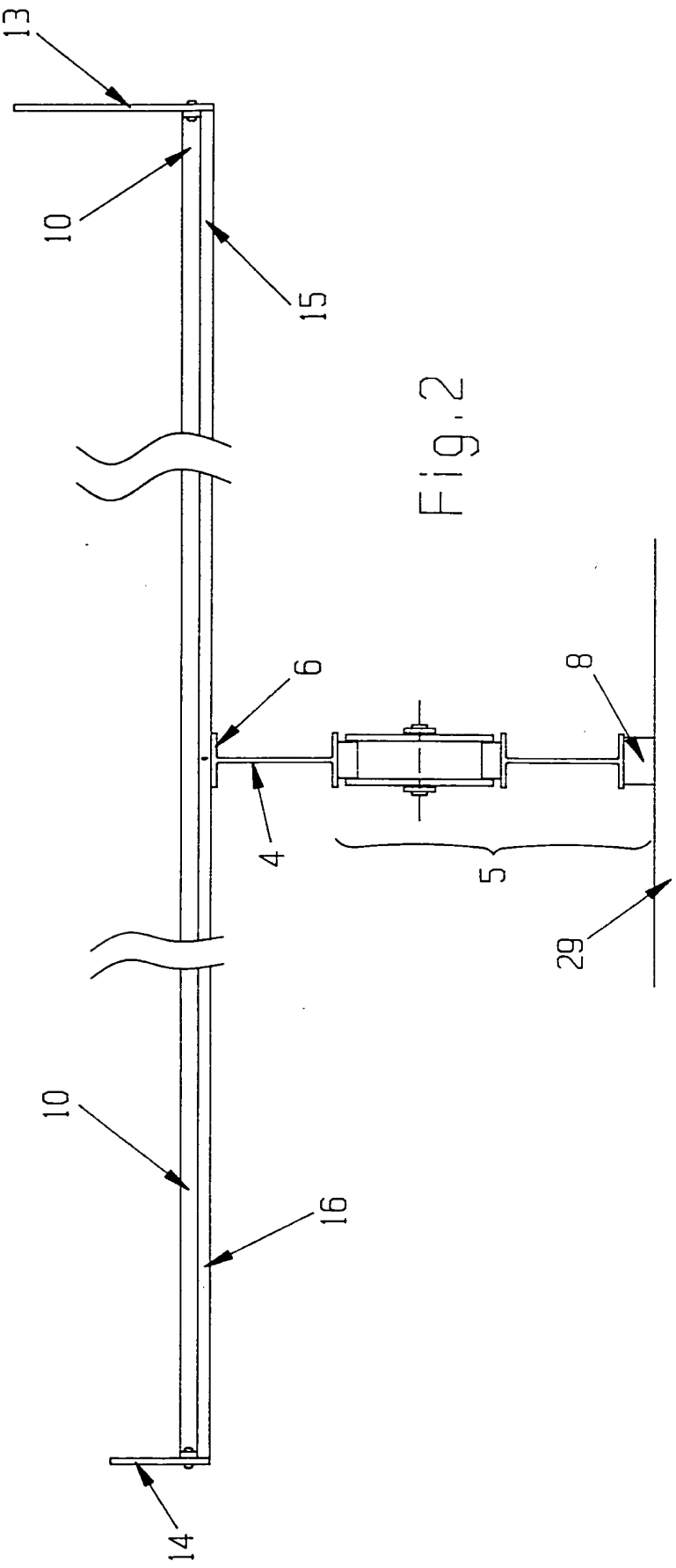


Fig.2

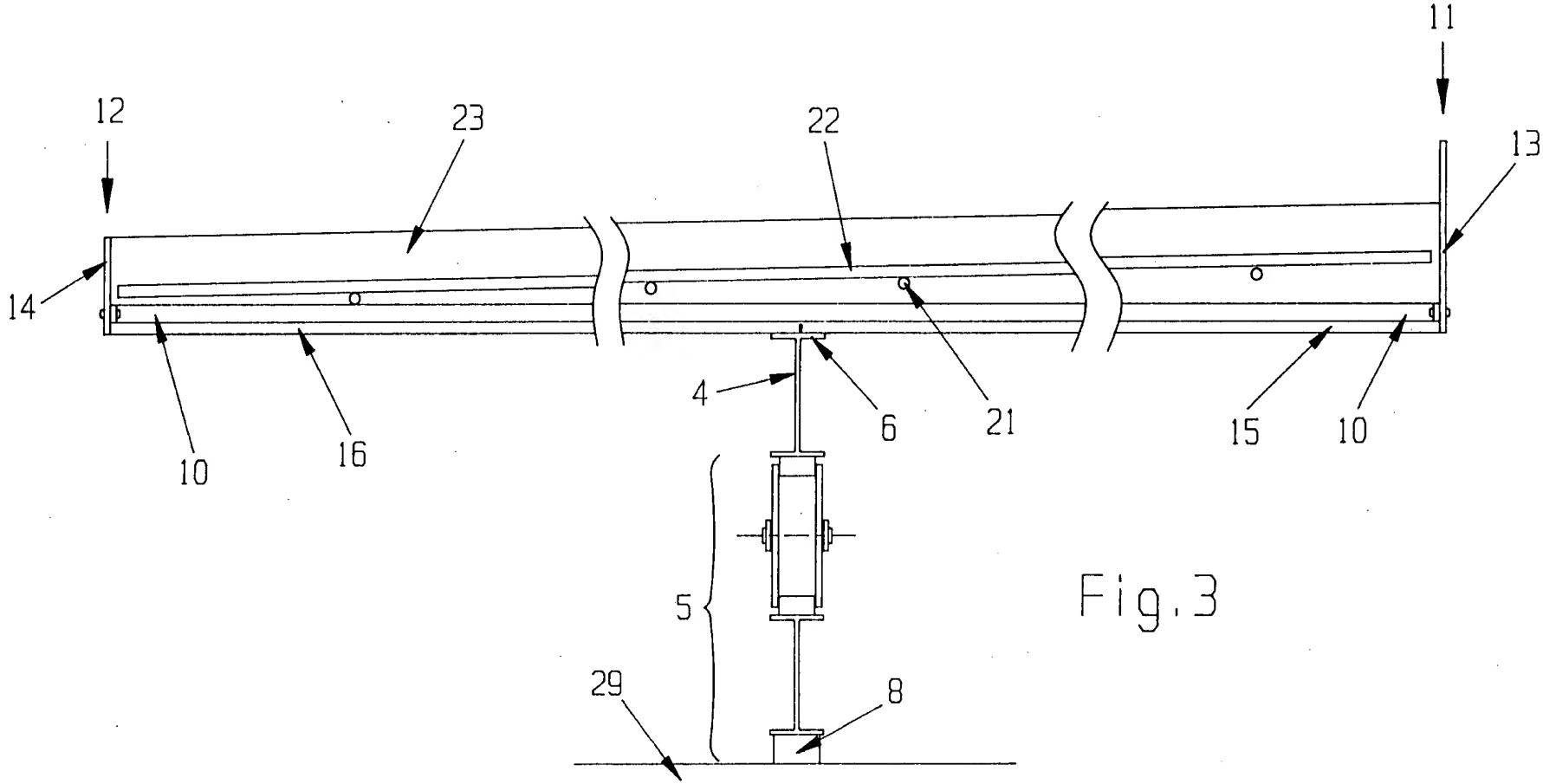


Fig.3

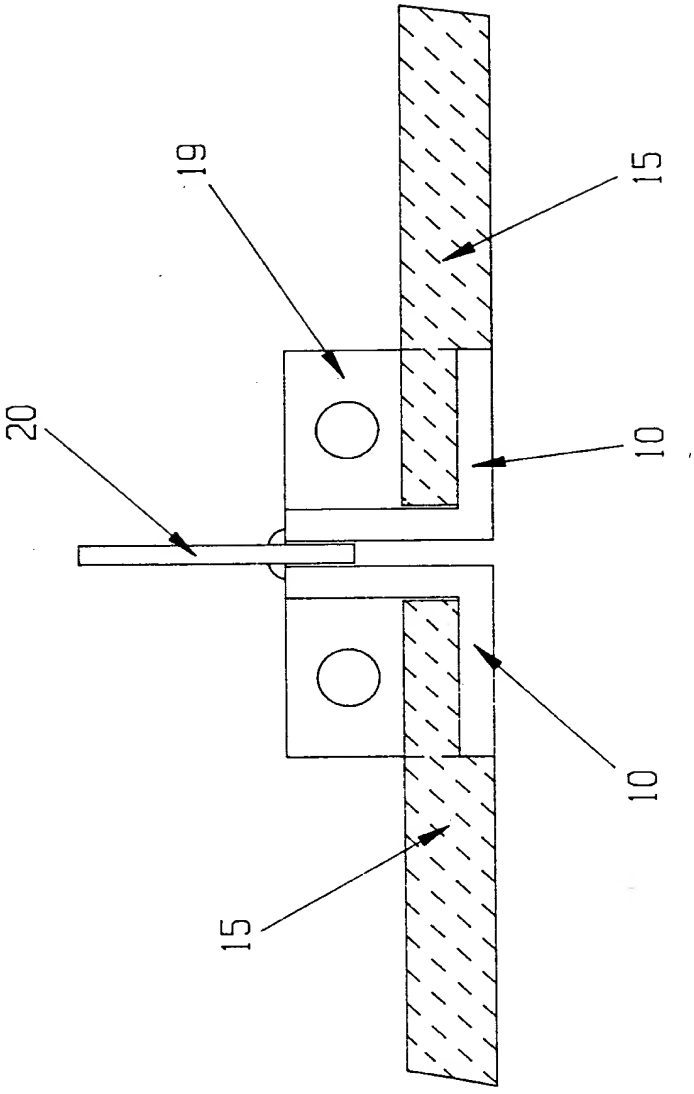


Fig.4

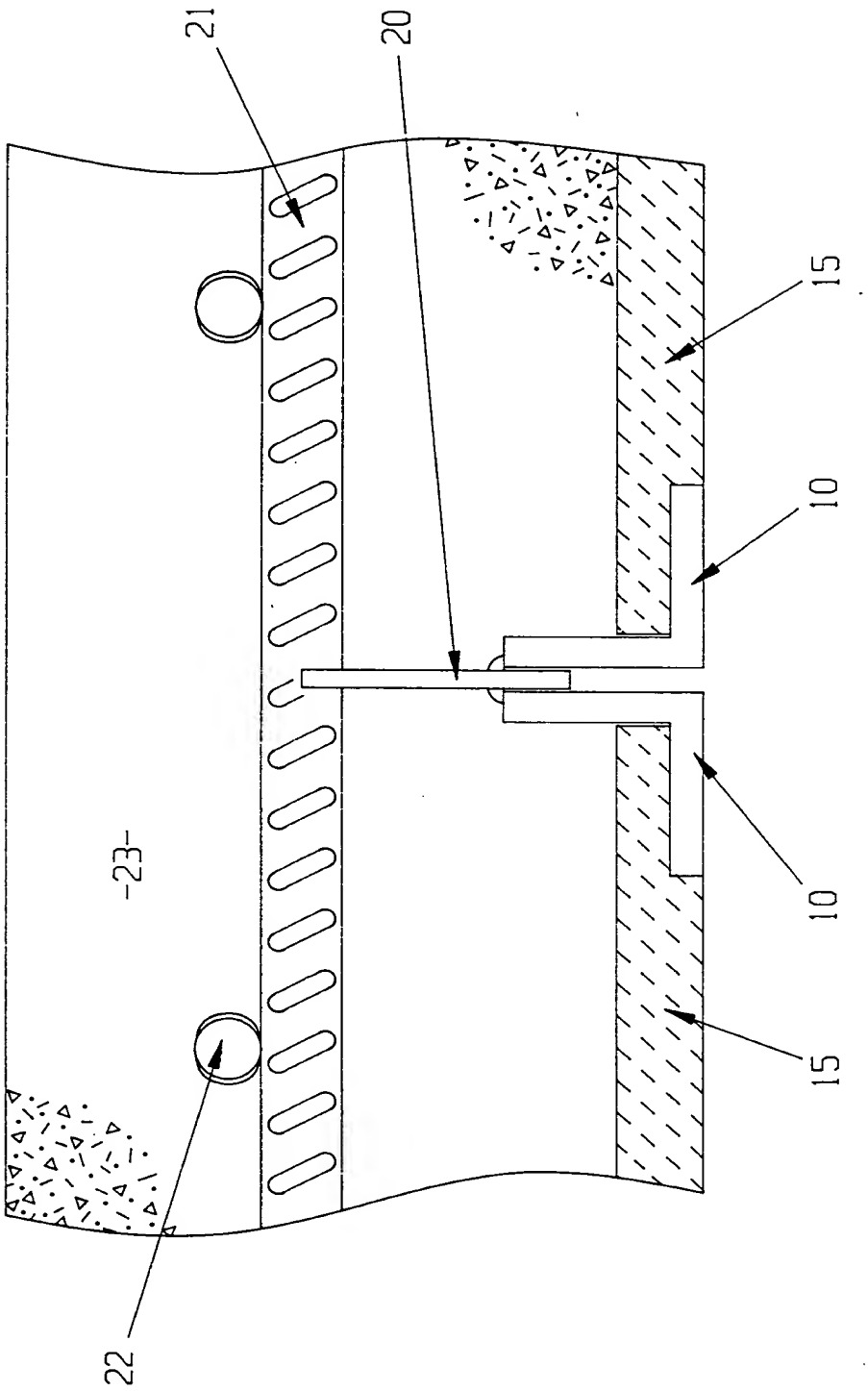


Fig.5

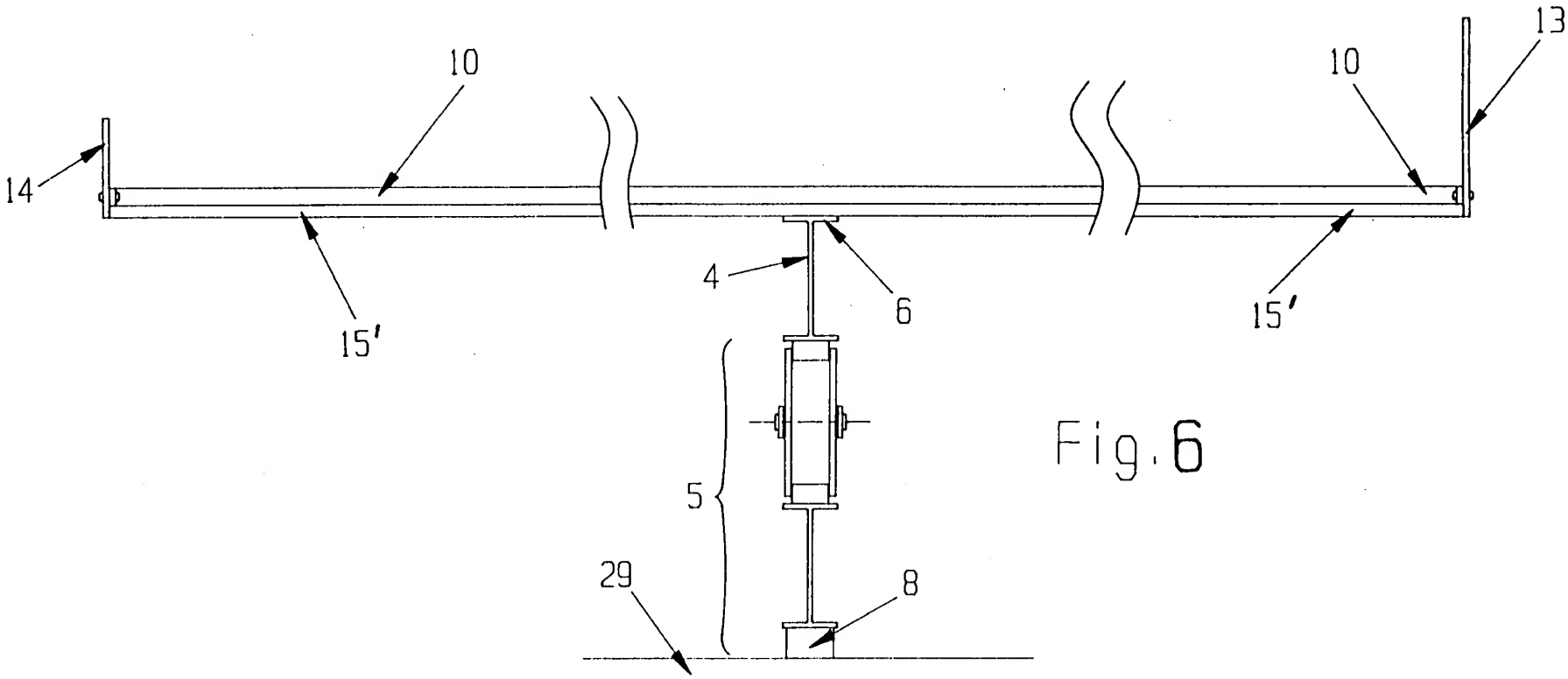


Fig.6